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MONTANA AGRICULTURAL COLLEGE, Bozeman, Montana.

RECENTLY RECOGNIZED SPECIES OF *CRATAEGUS* IN EASTERN CANADA AND NEW ENGLAND,—III.

C. S. SARGENT.

§ TENUIFOLIAE.

Anthers rose color or purple.

* Stamens 5–10.

CRATAEGUS TENELLA, Ashe, *Ann. Carnegie Mus.* i. 388, (May 1902).

I have referred provisionally to this eastern Pennsylvania and Delaware species a thin-leaved Thorn with 5–8 stamens, dark rose-colored anthers and oblong crimson fruit ripening early in September, which has been found in Connecticut by *C. B. Graves* at Waterford, and by *E. B. Harger* at Oxford where it is very abundant.

Crataegus fucosa, n. sp. Leaves ovate, acuminate, broadly concave cuneate to rounded at the entire base, finely doubly serrate, with incurved glandular teeth, and more or less deeply divided into numerous acuminate lateral lobes; when they unfold bright red and covered on the upper surface with short pale hairs, nearly fully grown, still

slightly villose and dark green tinged with red when the flowers open; at maturity thin, smooth, and dark yellow-green on the upper surface, paler on the lower surface, 3-5 cm. long, 2.5-3 cm. wide, with very slender yellow midribs and thin veins extending obliquely to the points of the lobes; petioles slender, often slightly wing-margined at the apex, obscurely grooved, 1.5-2 cm. long; stipules linear to lanceolate, bright red, often 1 cm. in length; on vigorous shoots leaves often pendant against the branch on stout winged glandular red petioles, more deeply lobed than the leaves of fertile branchlets, long-pointed, mostly truncate at the base, coarsely serrate, with straight teeth, 7-8 cm. long, 6-7 cm. wide, with stout bright rose colored midribs. Flowers 1.5 cm. in diameter on slender pedicels, in broad many-flowered thin-branched glabrous corymbs; bracts and bractlets linear to lanceolate, glabrous, bright rose color, large and conspicuous; calyx-tube broadly obconic, bright red before anthesis like the narrow elongated acuminate mostly entire gland-tipped lobes; stamens 5-10; anthers large, bright red; styles 3, surrounded at the base by a broad ring of pale tomentum. Fruit drooping on slender pedicels, in many-fruited clusters, oblong, full and round at the ends, scarlet, lustrous, marked by minute pale dots, 1.3-1.5 cm. in length, 9-12 mm. in diameter; calyx only slightly enlarged, with a small shallow cavity and reflexed lobes, entire or slightly and irregularly dentate towards the base, bright red on the upper side below the middle, mostly deciduous from the ripe fruit; flesh thin, yellow-green; nutlets 3, large for the size of the fruit, acute at the ends, prominently ridged on the broad back, with a high often grooved ridge, about 7 mm. long.

A shrub usually about 1 m. in height with nearly erect stems forming small thickets and covered with ashy gray bark, and stout zigzag branchlets dark dull red when they first appear, red-brown and very lustrous and marked by large pale lenticels during their first season, and ashy gray the following year, and armed with numerous very stout straight or slightly curved shining red-brown ultimately gray spines 3-4 cm. in length. Flowers about May 20th. Fruit ripens early in September and soon falls.

MASSACHUSETTS: Upland rocky pastures, Berlin, *J. G. Jack*, May 1900, West Boylston, *Mrs. J. E. Thayer* and *C. S. Sargent*, May and September 1901 and 1902. Common.

Easily distinguished in early spring by the bright red color of the young leaves, bud-scales and bracts, which make it conspicuous from a long distance, and in the autumn by the large drooping leaves with their bright rose colored midribs on the ends of the branches, and by the small very lustrous early ripening fruits.

Crataegus delucida, n. sp. — *Crataegus acutiloba*, Sargent, RHODORA, iii. 23 in part (1901).

Leaves ovate to broadly oval, acute, full and rounded or rarely cuneate, or on leading shoots truncate or slightly cordate at the mostly entire base, finely and often doubly serrate, with glandular teeth, and divided into 4 or 5 pairs of short acuminate spreading lateral lobes; covered above, early in the season, with short pale hairs; at maturity membranaceous, glabrous, very smooth and light yellow on the upper surface, pale on the lower surface, 3.5–4.5 cm. long, 3–4 cm. wide, or on leading shoots sometimes 6 cm. long and wide, with slender yellow midribs and very thin primary veins arching to the points of the lobes; petioles slender, nearly terete, 2–2.5 cm. long. Flowers about 1.2 cm. in diameter on slender elongated pedicels, in compound usually 7–12-flowered glabrous thin-branched compact corymbs; calyx-tube broadly obconic, the lobes gradually narrowed from broad bases, long, slender, acuminate, entire or occasionally furnished with a few minute glandular teeth; stamens 5–10; anthers large, light red; styles 3 or 4. Fruit in drooping clusters, oblong, full and rounded at the ends, bright scarlet, very lustrous, about 1.2 cm. in length; calyx small, sessile, with a narrow deep cavity and spreading closely appressed lobes, mostly deciduous from the ripe fruit; flesh thick, succulent, light yellow; nutlets 3 or 4, full and rounded at the ends ridged on the broad back, with a wide rounded ridge, 9 mm. long.

A treelike shrub 3 or 4 m. in height with slender stems covered with ashy gray bark, small ascending branches and thin nearly straight branchlets, dark green tinged with red when they first appear, light orange-red, lustrous and marked by numerous large white lenticels during their first season, becoming light gray-brown the following year and armed with numerous stout curved dark red-brown shining spines 3.5–4.5 cm. in length. Flowers from the 20th to the 25th of May. Fruit ripens late in September or early in October.

VERMONT: Low slopes of Bald Mountain in Clarendon and Salisbury, *W. W. Eggleston*, September 1899, May and September 1901; *C. S. Sargent*, June and September 1900. Common, often forming small thickets, and in the autumn very conspicuous from the abundance of its large bright colored fruits.

Crataegus demissa, n. sp. Leaves ovate to deltoid, acute, broadly cuneate to truncate at the base, sharply doubly serrate, with straight teeth tipped with large bright red glands, and slightly divided into numerous short acute lateral lobes; when the flowers open nearly fully grown, membranaceous, dark green and coated above with short silky white hairs; at maturity thin glabrous, 3–3.5 cm. long, 2.5–3 cm. wide, with slender midribs and primary veins

extending obliquely to the points of the lobes; on vigorous shoots mostly deltoid and truncate or cordate at the base, deeply lobed, 4-6 cm. long; petioles slender, nearly terete, glandular, with minute dark glands 1-1.2 cm. long. Flowers 9 or 10 mm. in diameter on short slender pedicels, in compact 5-10-flowered glabrous corymbs; bracts and bractlets linear, entire, bright red, caducous; calyx-tube narrowly obconic, glabrous, the lobes gradually narrowed from the base, elongated, acuminate, entire, tipped with dark red glands, reflexed after anthesis; stamens 5-10; anthers small, dark rose color; styles 3 or 4, usually 3, surrounded at the base by a broad ring of pale tomentum. Fruit in few-fruited drooping clusters, short-oblong to subglobose or slightly obovate, scarlet, lustrous, 8 or 9 mm. long and nearly as broad; calyx sessile, with a broad shallow cavity and closely appressed lobes bright red on the upper side below the middle; flesh very thin, yellow, dry and mealy; nutlets 3 or rarely 4, unusually large for the size of the fruit, obtuse at the ends, prominently ridged on the broad back, with a high wide ridge, about 7 mm. long.

A slender shrub generally not more than 1 m. in height with small erect stems and slender nearly straight branchlets marked by occasional large dark lenticels, green tinged with red when they first appear, becoming bright red-brown and lustrous during their first season and gray-brown the following year, and armed with numerous stout or slender slightly curved bright red-brown shining ultimately ashy gray spines 3-5 cm. long. Flowers during the last week of May. Fruit ripens late in August or early in September and soon falls.

MASSACHUSETTS: Meadows near the Stockbridge Bowl, Lenox, *C. S. Sargent*, August 1885, *Brainerd* and *Sargent*, May 30, 1902. VERMONT: Meadows, Charlotte, *C. S. Sargent*, September 7, 1900, *F. H. Horsford*, May 1902.

Well distinguished by the deltoid deeply lobed usually heart-shaped leaves on vigorous shoots, the small flowers and small nearly globose early-ripening fruit.

Crataegus glaucophylla, n. sp. Leaves broadly ovate, acute or short-pointed at the apex, rounded or broadly cuneate at the base, sharply and often doubly serrate above, with straight or incurved glandular teeth, and divided into 4 or 5 pairs of narrow acute or long-pointed lateral lobes; more or less tinged with red and roughened above by short pale caducous hairs when they unfold, more than half grown when the flowers open and then smooth light yellow-green and covered with a glaucous bloom above, pale and glaucous below, at maturity thin but firm in texture, light yellow-green on the upper surface, pale bluish green on the lower surface, about 6 cm. long and 4.5 cm. wide, or on vigorous shoots 7-8 cm. long and 6

cm. wide, with thin yellow midribs deeply impressed above and slender veins extending to the points of the lobes; petioles slender, slightly wing-margined at the apex, glandular, 2–2.5 cm. in length. Flowers small, on short slender pedicels, in long slender-branched glabrous usually 8–10-flowered compound corymbs; bracts and bractlets linear, minute, glandular, caducous; calyx narrowly obconic, green tinged with red, the lobes slender, elongated, acuminate, entire or occasionally glandular-serrate near the middle, reflexed after anthesis; stamens usually 10 or 5–10; anthers small, dark rose color; styles 3 or 4. Fruit on short thickened pedicels in drooping few-fruited clusters, short-oblong or rarely ovate, full and rounded at the ends, bright scarlet, very lustrous, marked by few large dots, 1.2–1.4 cm. long, about 1 cm. wide; calyx small, closely appressed, with a deep narrow cavity and lobes gradually narrowed from broad bases, acuminate, often slightly glandular-serrate; flesh thick, juicy, yellow, of a pleasant flavor; nutlets 3 or 4, thin, acute at the ends, prominently ridged on the back, with a broad sometimes slightly grooved ridge, about 8 mm. long.

A broad round-topped shrub 2–3 m. in height with numerous thick stems, covered with ashy gray bark, and stout zigzag branchlets marked by pale lenticels, yellow-green when they first appear, bright red-brown and lustrous during their first season, becoming dull light red-brown the following year, and armed with many slender red-brown shining straight or slightly grooved spines 2–7 cm. in length. Flowers during last week of May. Fruit ripens early in September but does not fall until the middle of October.

MASSACHUSETTS: Meadows near the Stockbridge Bowl, Lenox, *C. S. Sargent*, August 17, 1885; *Brainerd* and *Sargent*, May 30, 1902; *C. S. Sargent*, September 8, 1902; by the road from Great Barrington to Alford, *Brainerd* and *Sargent*, May 31, 1902; Great Barrington, *C. S. Sargent*, September 8, 1902. NEW YORK: incomplete specimens collected by *C. H. Peck* at Sand Lake, Rensselaer County, and at Westport during the season of 1902 appear to belong to this species.

Crataegus ascendens, n. sp. *Crataegus acutiloba*, *Sargent*, RHODORA, iii. 23, in part.

Leaves oblong-ovate, acuminate, full and rounded or cuneate at the glandular base, finely and occasionally doubly serrate, with straight or incurved gland-tipped teeth, and slightly divided into 4 or 5 pairs of short broad acuminate lateral lobes; tinged with red as they unfold and covered above early in the season with short white appressed hairs; more than half grown when the flowers open, and at maturity thin but firm in texture, glabrous, dark yellow-green on

the upper surface, pale on the lower surface, 5.5–8.5 cm. long, 4.5–6 cm. wide, with slender yellow midribs and very thin primary veins extending to the points of the lobes; petioles slender, glandular with minute scattered dark mostly early deciduous glands, 2–3 cm. in length; stipules linear, acuminate, glandular-serrate, caducous. Flowers 1.4–1.5 cm. in diameter on slender pedicels, in broad compact many-flowered compound thin-branched glabrous corymbs; bracts and bractlets oblong-obovate, acute, finely glandular-serrate, caducous; calyx-tube narrowly obconic, the lobes slender, elongated, entire or sparingly and minutely glandular-serrate, reflexed after anthesis; stamens 10; anthers pink; styles 3 or 4. Fruit in broad drooping many-fruited clusters, oblong-obovate until late in the season, becoming oblong and full and rounded when fully ripe, dark crimson, lustrous, 1.3–1.4 cm. long, about 1.2 cm. wide; calyx small, sessile, with a deep shallow cavity and spreading lobes; flesh thick, yellow, soft and succulent; nutlets 3 or 4, thin, full and rounded at the ends, ridged on the narrow back, with a low round ridge, 9 mm. long.

A shrub 2–3 m. in height with numerous slender stems spreading into small thickets or rarely arborescent, ascending branches, and thin nearly straight branchlets dark olive green when they first appear, dark dull red-brown and marked by oblong pale lenticels during their first season, becoming light reddish brown the following year, and armed with few stout curved bright chestnut-brown spines 1.5–3 cm. in length. Flowers at the end of May. Fruit ripens the middle of October.

VERMONT: Low mountain slopes and hillsides at the western base of the Green Mountains up to elevations of 500 feet above the sea-level only in loamy or gravelly soil, Bristol, *C. G. Pringle*, September 1879; New Haven, May, July, September and October, 1900, Middlebury, October 13, 1900, *Ezra Brainerd*; West Rutland, *W. W. Eggleston*, May 1900.

Crataegus Randiana, n. sp. Leaves ovate to broadly oval, acute or acuminate, cuneate or rounded at the base, finely and above the middle mostly doubly serrate, with straight or incurved gland-tipped teeth, and slightly divided into short acute or acuminate spreading narrow lobes; nearly fully grown when the flowers open and then light yellow-green and covered above with short appressed white hairs and glabrous below; at maturity membranaceous, glabrous, yellow-green, 5–6 cm. long, 4.5–5 cm. wide, or on leading shoots 7.5 cm. long and broad, with very slender yellow midribs slightly impressed on the upper side and thin primary veins extending obliquely to the points of the lobes; petioles slender, nearly terete, sparingly glandular, with minute dark glands, 2–4 cm. long.

Flowers about 1.5 cm. in diameter on elongated slender pedicels, in lax thin-branched glabrous 7–12-flowered compound corymbs; calyx-tube narrowly obconic, the lobes gradually narrowed from broad bases, acuminate, entire or occasionally slightly serrate, tipped with bright red glands, reflexed after anthesis; stamens usually 5, occasionally 7; anthers large, dark rose color; styles 3 or 4. Fruit drooping on slender pedicels, oblong, full and rounded at the ends, scarlet, lustrous, marked by occasional pale dots, 1–1.2 cm. long, 8–9 mm. wide; calyx small, sessile, with a narrow shallow cavity and erect incurved lobes mostly deciduous from the ripe fruit; flesh thin, dry and mealy; nutlets 3 or 4, broad, rounded at the ends, prominently ridged on the back, with a wide rounded ridge, 6 mm. long.

A shrub 3–4 m. in height with numerous stout stems covered with ashy gray bark, erect branches forming an open irregular head, and slender nearly straight branchlets marked by small pale lenticels, dull green and tinged with red when they first appear, bright red-brown and lustrous during their first season, becoming pale gray-brown the following year, and armed with very slender straight bright red-brown shining ultimately ashy gray spines 3.5–4 cm. in length. Flowers from the 5th to the 10th of June. Fruit ripens from the middle to the end of September.

MAINE: Low moist meadows near Bar Harbor, Mt. Desert Island, *C. S. Sargent*, September 4, 1899; *Miss Beatrix Jones*, September 20, 1899, June and September 1901.

The name of Edward L. Rand, one of the authors of the *Flora of Mt. Desert Island* and the secretary of the New England Botanical Club, may be appropriately connected with this handsome and distinct plant.

Crataegus crudelis, n. sp. Leaves ovate, acute, broadly cuneate or rarely rounded at the usually entire base, finely and often doubly serrate, with glandular straight or incurved teeth, and deeply divided into numerous narrow acute spreading or reflexed lobes; when they unfold villose above and along the midribs and veins below, about half-grown when the flowers open and then membranaceous, light yellow-green and covered above with short, appressed, lustrous white hairs and nearly glabrous below; at maturity thin, dark yellow-green and scabrate on the upper surface, pale on the lower surface, 6–7 cm. long, 5–6 cm. wide, with thin midribs slightly impressed above and 5 or 6 pairs of slender primary veins arching obliquely to the points of the lobes; petioles nearly terete, slightly winged at the apex, glandular with numerous small dark persistent glands, 2–3 cm. long; stipules linear, glandular, caducous. Flowers 2 cm. in diame-

ter on long slender slightly villose pedicels, in broad compound many-flowered thin-branched hairy corymbs; bracts and bractlets linear, small, caducous; calyx-tube broadly obconic, villose at the base, glabrous above, the lobes linear, acuminate, sparingly glandular-serrate, mostly only above the middle, villose on the inner surface, reflexed after anthesis; stamens 10; anthers pink; styles 3-5, surrounded at the base by a broad ring of pale tomentum. Fruit on stout glabrous or slightly hairy pedicels, in broad drooping many-fruited clusters, oblong, full and rounded at the ends, crimson, lustrous, marked by large pale dots, 1-1.2 cm. long, 9-10 cm. wide; calyx sessile, with a broad deep cavity and much elongated lobes gradually narrowed from broad bases, villose and dark red on the upper side toward the base; flesh thin, juicy, greenish white; nutlets 3-5, full and rounded at the ends, conspicuously ridge on the broad back, with a high narrow ridge, about 7 mm. long.

A shrub with numerous ascending stems 5-7 m. in height, and stout slightly zigzag branchlets marked by many large pale lenticels, dark yellow-green when they first appear, light red-brown and lustrous during their first season, gray tinged with red the following year, and armed with many stout straight or slightly curved bright red-brown lustrous ultimately ashy gray spines, on some individuals about 4 cm. long and on others from 8-10 cm. in length, and often furnished near the middle with a short lateral branch. Flowers at the end of May or early in June. Fruit ripens at the end of September.

PROVINCE OF QUEBEC: Valley of the St. Lawrence River near the City of Quebec; Montmorency Falls, August 1895; Montmorency Falls, Levis, and Isle of Orleans, September 1900; Montmorency Falls and Levis, May and September 1901, *J. G. Jack*.

This species resembles *Crataegus acutiloba*, Sargent (RHODORA, iii. 23), in the shape of its deeply lobed leaves, but differs from that species in its much larger flowers, in its villose corymbs and large fruits, and in the great size of the spines on some individuals, the largest of these being larger than those of any other species of this group which I have seen. *Crataegus acutiloba*, based on specimens gathered on Mt. Desert Island and at other points on the coast of Maine will, in view of the collections made during the last two years in the St. Lawrence valley, and western New England, be found probably to be confined to the coast region north of Massachusetts Bay.

CRATAEGUS MATURA, Sargent, RHODORA, iii. 24 (1901). This early-ripening species was first seen by Mr. Ezra Brainerd and myself near Middlebury, Vermont, in August and September 1900, and the

early ripening of the fruit noticed. When it was described flowers of the Middlebury plant had not been collected but flowering specimens of a species with twenty stamens which had been collected by Mr. A. W. Edson at Burlington, Vermont, were thought to belong to this species and on these specimens so much of the description as relates to the flowers was based. Flowers collected the following year by Mr. Brainerd from the plant which had furnished the fruiting specimens on which *Crataegus matura* was in part established show the error of the previous determination and the importance of drawing the descriptions of *Crataegus* only from flowering and fruiting specimens taken from the same individual. The description of the flowering specimens from Middlebury is as follows:

Leaves more than half grown when the flowers open, membranaceous dark yellow-green and roughened above by short appressed white hairs, pale and glabrous below; stipules oblong-obovate and acuminate to lanceolate, coarsely glandular-serrate, often 1.3–5 cm. in length, caducous. Flowers about 1.6 cm. in diameter on slender pedicels, in broad many-flowered thin-branched glabrous compound corymbs; bracts and bractlets oblong-obovate to linear, acuminate, very coarsely glandular-serrate, large, conspicuous, turning red before falling, caducous; calyx-tube broadly obconic, the lobes gradually narrowed, slender, elongated, acuminate, bright red and glandular at the apex, entire or furnished with occasional minute teeth, reflexed after anthesis; stamens 5–10, usually 5–7; anthers red; styles 3–5, usually 3 surrounded at the base by a broad ring of pale tomentum.

***Crataegus florea*, n. sp.** Leaves ovate, acute or acuminate, rounded or broadly cuneate at the base, sharply and often doubly glandular-serrate, and slightly divided into 4 or 5 pairs of short acute lobes; nearly fully grown and slightly roughened above by short white hairs when the flowers open; at maturity thin but firm in texture, dark yellow-green and scabrate on the upper surface, paler and glabrous on the lower surface, 5.5–6 cm. long, 4–5 cm. wide, with slender yellow midribs and 5 or 6 pairs of thin primary veins arching to the points of the lobes; petioles slender, narrowly wing-margined at the apex, slightly grooved, sparingly glandular, with mostly deciduous glands, 2.5–3 cm. long; on vigorous shoots sometimes as broad as long, more deeply lobed, abruptly long-pointed. Flowers about 1.5 cm. in diameter on long slender pedicels, in numerous crowded many-flowered compound corymbs; bracts and bractlets linear, glandular, small, caducous; calyx-tube narrowly obconic, the lobes gradually narrowed from broad bases, slender, acuminate, entire or occasionally undulate or obscurely serrate, reflexed after anthesis; stamens 6–10; anthers red; styles 3 or 4, surrounded at the base by a thin ring of pale tomentum. Fruit oblong, full and rounded at the

ends, scarlet, lustrous, 1.3–1.5 cm. long; calyx sessile, with a broad shallow cavity and elongated spreading lobes often deciduous from the ripe fruit; flesh thin, yellow; nutlets 3 or 4, thin acute at the ends, ridged on the back, with a high rounded ridge, 8 mm. long.

An arborescent shrub sometimes 4 m. in height or often a broad low bush, with stout nearly straight branchlets marked by small pale lenticels, dull red-brown when they first appear, rather light reddish brown and lustrous during their first season, dull and darker the following year and ultimately ashy gray, and armed with very stout slightly curved red-brown shining spines 2.5–4 cm. in length. Flowers at the end of May. Fruit ripens late in September.

MAINE: valley of the middle Penobscot River, borders of streams and woods, Orono, *M. L. Fernald*, May and September, 1901.

Crataegus monstrata, n. sp. Glabrous with the exception of the short hairs on the upper side of the young leaves. Leaves ovate to oval, acuminate, cuneate at the entire base, sharply serrate above, with straight glandular teeth, and divided into 4 or 5 pairs of narrow acuminate lateral lobes; about half grown, light yellow-green and scabrate above and glabrous below when the flowers open, at maturity membranaceous, scabrate and yellow-green on the upper surface, pale on the lower surface, 5–6 cm. long, 3.5–4 cm. wide, with very slender nearly terete petioles 2.5–3 cm. in length; on leading shoots leaves ovate, full and rounded at the broad base, often 6 cm. long and wide, with stout petioles slightly wing-margined above the middle and often conspicuously glandular. Flowers on elongated slender pedicels, in broad many-flowered thin-branched compound corymbs; bracts and bractlets linear, small, glandular, turning red in fading, caducous; calyx-tube narrowly obconic, the lobes gradually narrowed from the base, slender, acuminate, entire or rarely obscurely serrate, tipped with small red glands, reflexed after anthesis; stamens 5–7; anthers light violet color; styles usually 3. Fruit in few-fruited drooping clusters, oblong, full and rounded at the ends, bright scarlet marked by many minute pale dots, about 4 cm. long and 9 or 10 mm. wide; calyx small, sessile, with a broad shallow cavity, closely appressed entire or slightly serrate lobes; flesh thin, yellow, somewhat juicy; nutlets 3, rounded at the ends, thin, prominently ridged on the back, with a broad slightly grooved ridge, 7 mm. long.

Usually shrubby, but occasionally arborescent in habit and 3 m. in height, with ascending branches and slender slightly zigzag branchlets, light orange-green when they first appear, dull red-brown and marked by occasional small pale lenticels during their first season, and light reddish brown or ashy gray the following year, and armed with many slender slightly curved red-brown ultimately gray spines

3–5 cm. in length. Flowers during the last week in May. Fruit ripens about the middle of September.

CONNECTICUT: northern part of the valley of Eight Mile Brook, Southbury and Middlebury, *E. B. Harger*, May and September, 1901. Very abundant. “Most of the trees were so white with blossoms that they were noticeable from a distance of from one quarter to one half of a mile.” (*E. B. Harger in litt.*)

Crataegus blandita, n. sp. *Crataegus pastorum*, Sargent, RHODORA, iii. 76, in part (1901).

Leaves broadly ovate, acute, truncate, rounded or rarely cuneate or on leading shoots mostly subcordate at the base, sharply sometimes doubly serrate, with glandular teeth, slightly divided into 3 or 4 pairs of broad short-pointed lateral lobes; tinged with red and covered with short pale hairs when they unfold, more than half-grown when the flowers open and then dark green and roughened on the upper surface with short lustrous white hairs and pale and glabrous on the lower surface; at maturity thin but firm in texture, smooth, dark yellow-green above, light yellow-green below, about 5 cm. long and 4 cm. wide, or on vigorous shoots often 6 cm. long and wide, with slender yellow midribs slightly impressed above and 3–5, usually 4, pairs of thin primary veins arching obliquely to the points of the lobes; petioles slender, nearly terete, glandular, with small dark red deciduous glands, frequently rose-color in the autumn, 2–3.5 cm. long; stipules linear, acuminate, often lobed at the base on vigorous shoots, glandular with bright red glands, caducous. Flowers 1.2–1.3 cm. in diameter on long slender pedicels, in thin-branched glabrous mostly 10-flowered compound corymbs with 3- or 4-flowered peduncles from the axils of the upper and occasionally also of the second leaf; bracts and bractlets linear, acuminate, glandular, small, caducous; calyx-tube narrowly obconic, the lobes slender, elongated, acuminate, finely and irregularly glandular-serrate, villose on the inner surface, reflexed after anthesis; stamens 5–10, usually 10; anthers purple; styles 3 or 4, surrounded at the base by a narrow ring of pale tomentum. Fruit in drooping many-fruited clusters, oblong, full and rounded at the ends, 1.2–1.5 cm. long, 8 or 9 mm. wide, scarlet, lustrous, marked by many small pale lenticels; calyx small, sessile, with a narrow deep cavity, and lobes villose above, spreading and reflexed, often deciduous from the ripe fruit; flesh thin, yellow; nutlets 3 or 4, acute at the ends, ridged on the back, with a broad rounded ridge, about 8 mm. long.

A shrub 2–4 m. in height with numerous erect stems spreading into small thickets, and stout zigzag branchlets marked by large pale lenticels, dark dull orange-green tinged with red when they first appear dull reddish or orange-brown during their first season, light

reddish brown the following year, later becoming lustrous and gray tinged with red, and armed with many very stout curved light red-brown spines 2.5-4.5 cm. in length. Flowers at the end of May. Fruit ripens late in September or early in October.

PROVINCE OF QUEBEC: Rocky limestone ridges, Caughnawaga Indian Reservation [Adirondack Junction]; Montreal Island, [Montreal West]; Ile Perrot, Longueuil, *J. G. Jack*, August and September 1899, May 1900, May and September 1900, 1902.

Specimens of this species were referred by me two years ago to *Crataegus pastorum*, Sargent, a species which is probably confined to central and southern Massachusetts. From this species *Crataegus blandita* differs in its more deeply lobed yellow not blue-green leaves, in its larger flowers, in fewer-flowered corymbs, and its larger darker-colored fruit.

Crataegus genialis, n. sp. *Crataegus pastorum*, Sargent, RHODORA, iii. 24 (1901) in so much as relates to Berkshire County, Massachusetts, and the Champlain Valley of Vermont.

Leaves oval, acute or acuminate, rounded or cuneate or often oblique at the entire base, finely and usually doubly serrate above, with straight or incurved glandular teeth, and mostly slightly divided above the middle into 1-4 pairs of short acute lobes; slightly tinged with red or light bronze color and roughened above by short pale hair when they unfold, nearly fully grown, membranaceous, dark green and scabrate above when the flowers open; at maturity thin but firm in texture, smooth and very dark green on the upper surface, pale blue-green on the lower surface, mostly pendant, 5-7 cm. long, 5.5-6 cm. wide, with slender yellow midribs and primary veins running obliquely to the points of the lobes; petioles very slender, nearly terete, 2-3 cm. long; stipules linear, acuminate, glandular-serrate, caducous; on vigorous shoots leaves often 6-7 cm. long and broad and rounded or acuminate at the apex, coarsely serrate, their lateral lobes sometimes broad and rounded, coriaceous, very dark green, with stout rose-color midribs and thick dark red petioles generally wing-margined to below the middle, not more than 1 cm. in length and about as long as the broad foliaceous lunate stipules. Flowers 1.3-1.5 cm. in diameter on slender elongated pedicels, in broad many-flowered compound glabrous corymbs; bracts and bractlets linear, glandular, red before falling, caducous; calyx-tube narrowly obconic, the lobes slender, acuminate, entire or occasionally sparingly dentate, reflexed after anthesis; stamens 5-10; anthers small, rose color or purple; styles 3. Fruit on long slender pedicels in drooping many-fruited clusters, oblong, full and rounded at the ends, yellow-green when fully grown, becoming at maturity dark crimson, and lustrous, marked by numerous small pale dots, 1.1-1.2 cm. long, 8-9 mm. wide;

calyx somewhat enlarged, closely appressed, with a broad shallow cavity and slender lobes gradually narrowed from broad bases, acuminate, mostly entire, bright red on the upper side near the base; flesh thin, greenish yellow; nutlets 3, acute at the ends, prominently ridged on the narrow back, with a high ridge, about 6 mm. long.

A shrub 3 or 4 m. in height with slender stems covered with pale gray bark, ascending branches forming an open head, and stout very zigzag branchlets marked by large pale lenticels, yellow-green more or less tinged with red when they first appear, bright red-brown and lustrous during their first season, gray-brown the following year, and armed with many stout mostly curved bright red-brown shining ultimately gray spines 1.8–3.5 cm. in length. Flowers during the last week of May. Fruit ripens early in October, often remaining on the branches after the leaves have fallen.

MASSACHUSETTS: Meadows near the Stockbridge Bowl, *Brainerd* and *Sargent*, May 30, 1902, *C. S. Sargent*, September 9, and October 3, 1902; roadside, North Adams to Williamstown, *Brainerd* and *Sargent*, May 29, 1902, *C. S. Sargent*, September 1902. VERMONT: New Haven and North Ashburnham, October 1899, New Haven, August 1900, Salisbury Plain and Middlebury, September 1900, along the New Haven River, August and October 1900, *E. Brainerd*; Middlebury, *C. S. Sargent*, September 1900; Putney, *W. W. Eggleston*, October 1902; Bellows Falls, *J. G. Jack*, September 1901, (with earlier ripening fruit).

Crataegus dissimilis, n. sp. Leaves acuminate, full and rounded or broadly cuneate at the entire more or less oblique base, finely often doubly glandular-serrate above, and slightly divided into 3 or 4 pairs of small acute or acuminate lateral lobes; more than half grown, dark green and scabrate above and pale below when the flowers open; at maturity thin but firm in texture, glabrous, dark yellow-green and smooth on the upper surface, light yellow-green on the lower surface, 4–5 cm. long, 3–5 cm. wide, with thin yellow midribs and slender primary veins extending very obliquely to the points of the lobes; petioles slender, nearly terete, 1.5–3 cm. in length; on vigorous shoots leaves sometimes 6–7 cm. long and wide, usually slightly cordate at the base and more deeply lobed than the leaves of lateral branchlets, with stout petioles 1–1.2 cm. in length. Flowers 1.1–1.2 cm. in diameter when fully expanded, on slender pedicels, in loose thin-branched glabrous compound corymbs, the axillary peduncles elongated, sometimes 3–5 flowered, and rising above the terminal central part of the inflorescence; calyx tube narrowly obconic, tinged with red, the lobes slender, acuminate and long-pointed, entire or finely glandular-serrate below the middle, tipped with bright red

glands, reflexed after anthesis; stamens usually 10, rarely 8 or 9; anthers deep rose-purple; styles 3-5. Fruit in few-fruited erect clusters, short-oblong to obovate, in the early autumn dull red and slightly pruinose, when fully ripe, dark red, lustrous, destitute of bloom, 1.2-1.4 cm. long, about 1.2 cm. wide; calyx sessile, with a broad shallow cavity and spreading or reflexed lobes often deciduous from the ripe fruit; flesh thin, juicy, acidulous reddish orange color; nutlets usually 3 or 4, thick, acute at the ends, rounded and prominently ridged on the broad back, with a high rounded ridge, about 8 mm. long.

A shrub 3 or 4 m. in height with stems not more than 8 cm. in diameter, covered with light gray bark scaly near their base, spreading branches and slender nearly straight branchlets marked by numerous oblong pale lenticels, dull reddish brown and pruinose when they first appear, soon becoming bright red-brown and lustrous, and dark gray-brown or ashy gray in their second season, and armed with stout straight or slightly curved bright chestnut-brown and shining ultimately gray spines 4-5 cm. in length. Flowers about the 20th of May. Fruit ripens and begins to fall from the 1st to the middle of October.

CONNECTICUT: Open rocky pastures near the Niantic River, East Lyme, *C. B. Graves*, May and September 1902.

This species appears to be well distinguished by the unusual development of the lower branches of the inflorescence, by the character of the leaves which are thicker and more rigid than is usual in species of this group, and by the short-oblong or short-obovate fruit with red-tinted flesh.

Crataegus media, n. sp. Glandular with the exception of the caducous hairs of the young leaves. Leaves ovate to rhombic, acute, broadly cuneate or rounded at the entire base, coarsely often doubly serrate above, with straight glandular teeth, and slightly divided into 3 or 4 pairs of short acuminate lateral lobes, bright red and covered above with short lustrous white caducous hairs when they unfold, about half-grown, membranaceous, light yellow green and almost glabrous when the flowers open; at maturity subcoriaceous, dark dull blue green on the upper surface, pale blue-green on the lower surface, 4-6 cm. long, about 4 cm. wide, with thin light yellow midribs and usually 4 pairs of thin primary veins extending to the points of the lobes; petioles slender, wing-margined at the apex, slightly grooved, glandular above the middle early in the season, often tinged with red in the autumn, 1.5 to 3 cm. long; stipules linear to oblong, acuminate, coarsely glandular-serrate, turning red before falling, caducous; on vigorous shoots leaves usually

full and rounded at the broad base, coarsely serrate, more deeply lobed than the leaves on lateral branchlets, often 7–8 cm. long and nearly as wide. Flowers 1.3–1.4 cm. in diameter on slender pedicels, in small usually 5 or 6-flowered thin-branched compact corymbs; bracts and bractlets linear, acute, glandular-serrate, caducous; calyx-tube broadly obconic, the lobes slender, acuminate, entire or rarely sparingly serrate above the middle, tipped with minute red glands, reflexed after anthesis; stamens 5–8; anthers light rose color; styles 3–5, surrounded at the base by a broad ring of pale tomentum. Fruit in few-fruited drooping clusters, obovate, full and rounded at the apex, gradually narrowed from above the middle to the slender base, bright scarlet, 1.4–1.8 cm. long, 1–1.4 cm. wide; calyx enlarged, sessile with a broad shallow cavity and reflexed closely appressed lobes often slightly dentate toward the apex, bright red on the upper side at the base, mostly persistent; flesh thick, sweet, nearly white, dry and mealy; nutlets 3–5, thick or thin according to their number, acute at the ends, rounded and prominently ridged on the back, with a high rounded ridge, about 8 mm. long.

An arborescent shrub 3–4 m. in height with erect branches and slender slightly zigzag branchlets, light yellow-green when they first appear, dull dark red-brown and marked by occasional large oblong pale lenticels during their first season, orange color and rather lustrous the following year, and armed with numerous slender slightly curved dark purple shining spines 4–6 cm. in length. Flowers during the last week of May. Fruit ripens early in October.

CONNECTICUT: Borders of swamps in low moist soil, Oxford, *E. B. Harger*, May and August 1901, October 1902; *C. S. Sargent*, September 1902.

This interesting species with its small flowers in few-flowered corymbs, small number of stamens, leaves at first hairy on the upper surface but dark green and subcoriaceous at maturity, and pear-shaped fruits without bloom or a calyx-tube, appears intermediate between the *Tenuifolia* and *Pruinosa* sections of the genus and might be referred with equal propriety to either.

* * Stamens usually 20.

***Crataegus Forbesae*, n. sp.** Leaves ovate to oval, acuminate, gradually narrowed and rounded or broadly concave-cuneate at the mostly entire base, serrate, often doubly with small straight or incurved glandular teeth, and slightly divided into 3 or 4 pairs of short acute lateral lobes; tinged with red when they unfold and coated above until after the flowers open with short soft pale hairs, at maturity dull dark bluish green and glabrous on the upper surface, paler on

the lower surface, 4-5 cm. long, 3.5-4.5 cm. wide, with slender yellow midribs deeply impressed above and very thin primary veins extending obliquely to the points of the lobes; petioles slender, slightly grooved, often wing-margined at the apex by the decurrent bases of the leaf-blades, 1.5-2.5 cm. long; stipules linear, acuminate, glandular, caducous; on leading shoots leaves sometimes 5-6 cm. long and nearly as wide as long, more deeply lobed than the leaves of fertile branchlets, their petioles stout, wing-margined to below the middle, conspicuously glandular, often rose color. Flowers 1.8-2 cm. in diameter on long slender pedicels, in broad thin-branched many-flowered compound glabrous corymbs; bracts and bractlets linear to oblong-obovate, glandular, caducous; calyx-tube broadly obconic, the lobes gradually narrowed from broad bases, acuminate, entire or rarely sparingly serrate near the middle, glandular and reddish at the apex; stamens 20, rarely 15-18; anthers large, dark rose color; styles 4 or 5, surrounded at the base by a broad ring of pale tomentum. Fruit in many-fruited erect or drooping clusters, subglobose to short-oblong, full and rounded at the ends, scarlet, lustrous, marked by numerous large pale dots, 1-1.2 cm. in diameter; calyx prominent, sessile, with a broad deep cavity and nearly entire appressed lobes, dark red on the upper side near the base and generally persistent on the ripe fruit; flesh thin, juicy, pale yellow; nutlets 4 or 5, usually 5, thin, acute at the ends, slightly or prominently ridged on the back, about 7 mm. long.

A broad round-topped shrub 3-5 m. in height, sometimes beginning to flower when less than 1 m. tall, with numerous stout stems covered with smooth gray bark, and slender branchlets marked by many small pale lenticels, dull red-brown when they first appear, bright red-brown and lustrous during their first season, dull gray-brown the following year, and ultimately ashy gray and armed with stout slightly curved often blunt spines 2-4 cm. in length. Flowers about May 20. Fruit ripens from the 10th to the middle of September and soon falls.

MASSACHUSETTS: Open rocky pastures in moist soil, Clinton, Stirling, West Boylston, *Evelyn Forbes Thayer*, May and September 1901 and 1902. CONNECTICUT: In a hedge on Harris Court, New London, *C. E. Graves*, May and September 1902, *C. S. Sargent*, August 1902.

The maiden name of Mrs. John E. Thayer, an industrious collector and student of *Crataegus* growing in her native County of Worcester, Massachusetts, may properly be associated with this handsome plant, one of several undescribed forms which she has helped to make known.

Crataegus Alnorum, n. sp. Leaves acute or acuminate, sharply and usually doubly glandular-serrate or simply crenately serrate at the broad rounded or cuneate base, and divided into four or five pairs of small acuminate spreading lobes; coated with short lustrous white hairs when they unfold, nearly fully grown when the flowers open and then membranaceous, light yellow-green and still covered with hairs above and glabrous below; at maturity thin but firm, glabrous, dark bluish green on the upper surface, pale blue-green on the lower surface, 4.5–5.5 cm. long, 3.5–4.5 cm. wide, with slender yellow midribs slightly impressed above and thin primary veins arching to the points of the lobes; petioles slender, nearly terete, slightly wing-margined at the apex, glandular with small dark red deciduous glands, 1.5–3 cm. in length. Flowers 1.7 cm. in diameter on slender pedicels in broad thin-branched glabrous many-flowered compound corymbs; bracts and bractlets linear, glandular, small, mostly fallen before the flowers open; calyx-tube broadly obconic, the lobes abruptly narrowed from wide bases, slender, acuminate, entire or finely serrate, with occasional small gland-tipped teeth; styles 3–5, surrounded at the base by a narrow ring of pale tomentum. Fruit in gracefully drooping few or many-fruited clusters, oblong-obovate, bright scarlet, lustrous, about 1.2 cm. long and 8 mm. wide; calyx sessile, with a broad shallow cavity and reflexed appressed lobes often deciduous from the ripe fruit; flesh thin, yellow, dry and mealy, nutlets 3–5, thin, acute at the narrow ends, prominently ridged on the back, with a high grooved ridge, about 7 mm. long.

A slender arborescent shrub 3–5 m. in height with ascending branches and slender nearly straight or slightly zigzag branchlets marked by occasional oblong pale lenticels, dark yellow-green more or less tinged with red when they first appear, bright red-brown during their first season, becoming light or dark gray-brown in their second year, and only slightly armed with stout straight or somewhat curved bright red-brown ultimately ashy gray spines 2.5–3 cm. long. Flowers at the very end of May or in early June. Fruit ripens toward the end of September.

MAINE: Valley of the middle Penobscot River in low sandy soil mixed with or bordering Alder thickets, Orono, *M. L. Fernald*, May and September 1901. The most common species in the region often covering acres of ground with many hundreds of plants.

ARNOLD ARBORETUM.

AJUGA GENEVENSIS IN NEW ENGLAND.—In the last edition of Gray's Manual and in Britton and Brown's Illustrated Flora only one species of Ajuga is given and that is introduced, growing in New England and the Middle States, *A. reptans*, L. Dr. Britton's later Flora, however, states in the appendix that *A. genevensis*, L., has become established at a station in Pennsylvania. This is similar to *A. reptans*, L., but differs from that species in its larger flowers, stouter habit, more pubescent stem and leaves, and in its lack of runners.

A. reptans is established near Saco, Maine, about New York City, and is reported from various other stations. A recent investigation shows that some reports of stations for this species are erroneous and that the plant is *A. genevensis* instead. Many of the reports of Ajuga are not based on herbarium specimens so it is at present impossible to say just how many should be credited to *A. reptans* and how many to *A. genevensis*.

I have seen specimens of the latter species from New York City, collected many years ago by Judge Brown (the station is now probably improved out of existence), from Danville, Pennsylvania (the station noted in Dr. Britton's Flora), from New Haven, Connecticut, where it seems to be well established, and from Southington, Connecticut, where it is established at two stations. This is the plant listed in the recent Southington Flora as *A. reptans*, L. We certainly have both species of Ajuga established here in New England and the writer would be very glad to get specimens of either from any station so that we may find their exact distribution.—C. H. BISSELL, Southington, Connecticut.

RED-FLOWERED ANEMONE RIPARIA.—*Anemone riparia*, the tall graceful Anemone of calcareous northern river-banks, was originally described¹ as having large white sepals, rarely varying to greenish white. Recently, however, Mr. George H. Richards has brought to the Gray Herbarium, with *Dryas Drummondii*, *Anemone multifida*, and other unusual plants collected by him on the banks of Grand River, Gaspé County, Quebec, a specimen of *Anemone riparia* with deep red sepals. This extreme color-variation, although previously

¹ RHODORA, i, 51, t. 3 (1899).